# THE EFFECT OF BACKGROUND MUSIC ON THE SPEED AND ACCURACY OF BEGINNING TYPEWRITING STUDENTS

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by

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# THE EFFECT OF BACKGROUND MUSIC ON THE SPEED AND ACCURACY OF BEGINNING TYPEWRITING STUDENTS

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# CHAPTER I

## INTRODUCTION

Many studies have been done in industry, hospitals and prisons regarding the effects of background music on production, attitudes, and behaviors of employees.[1] Research of this nature attempted to discover what specific effects the music had on the listener and under what conditions these effects were most noticeable.

## I. STATEMENT OF THE PROBLEM

Methods of teaching typewriting have not changed noticeably in the past, despite the fact that the trend has been to shorten the length of typewriting instruction from two years to one year, or even to one semester, in some cases. Therefore, teachers are being forced to look for new methods of teaching more effectively and efficiently. New techniques, such as the use of music, are now being investigated to find ways of solving this problem.

## II. NEED

In the field of typewriting instruction, studies of

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[1] Doris Soibelman, Therapeutic and Industrial Uses of Music, A Review of the Literature (New York: Columbia University Press, 1948), p. 205.

the effects of background music are limited. The methods and procedures used in the experimentations have varied widely from researcher to researcher. Most of the investigators do agree, however, that more research in this field is needed. Also, the conflicting results of those studies that have been done indicate a need for further research.

## III. PURPOSE

The purpose of this study was to determine the effects, if any, of background music on the speed and accuracy of beginning typewriting students during three-minute timings. Specifically, the researcher wanted to determine if background music would affect either the gross words per minute rate and the total number of errors of the subjects during three-minute timed writings from straight copy material.

## IV. LIMITATIONS

This study was limited to four beginning typewriting classes at Valley High School, West Des Moines, Iowa.

Two classes met in the fall semester, 1970, and two met in the spring semester, 1971; all classes were taught by the researcher. The administration determined the time of the class meetings.

The study was also limited to students' achievement on three-minute timings. It did not include achievement on

production work because of the subjectivity involved in grading work of that nature.

## V. DEFINITION OF TERMS

The following terms are used in this study and are defined here for clarification.

Timing. A timing is typing from straight copy material in the typing text for a specified period of time.

Straight copy material. Straight copy material is material that can be typed line by line from the text without need for correction or revision.

GWAM. GWAM is the abbreviation of gross words a minute; the total number of words typed per minute without penalty for errors.

Error. An error in typewriting is any deviation from the printed copy.

Background music. Background music is scientifically programmed music supplied by 3M Background Music System consisting of rhythmic music and modified rock music.

# CHAPTER II

## REVIEW OF LITERATURE

As mentioned previously in this report, the use of background music in areas other than education has been tried and tested quite extensively. While these studies have not concurred in all of the findings, there is much evidence to indicate there are some desirable effects that result from using background music.

### I. EXPERIMENTS IN INDUSTRY

One study in industry was conducted with workers in a skateboard factory.[1] Twenty-six assembly-line personnel between the ages of 18-23 took part in the experiment conducted over a five-week period. Four types of music were played: dance, show, folk, and popular. There were also periods when no music was played. The experiment was designed to determine if there were any effects on the quantity and quality of production and the attitudes of the workers.[2]

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[1] Richard I. Newman, Jr., Donald L. Hunt, and Fen Rhodes, "Effects of Music on Employee Attitude and Productivity in a Skateboard Factory," Journal of Applied Psychology, L, (December, 1966), 493-496.

[2] Ibid.

The results showed no change in the productivity of the employees, but they had a favorable attitude to the music and thought they had done more work.[1]

An earlier experiment in industry carried out by Clark produced these more positive statements. "Music in industry is no longer an experiment. Its efficacy has been practically demonstrated under varying conditions and in nearly every field of industrial activity."[2] However, the author holds some reservations about the study. In a section of the book titled, "It Increases Production," not a single example or statistic was listed to validate the statement.

A later book, published in 1948, tends to disagree with Clark regarding the positive effects of music in industry. Soibelman contends:

> It may be said that every use of music is in effect an experiment, since there are as yet no valid established methods that may claim therapeutic certainty. While music may be used in a number of ways, how it acts is a matter still to be learned. With few exceptions the experimental findings have served rather to pose new questions than to clarify the problems relating to the effects of music.[3]

Although this book was written nearly twenty years after Clark's, controversy still existed despite Clark's

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[1] Ibid.

[2] Kenneth S. Clark, Music In Industry (New York: National Bureau for the Advancement of Music, 1929), p. 1.

[3] Soibelman, op. cit., p. 205.

positive statements. Why the variance in findings? Part of the reason is due to the different types of jobs involved in the various studies.[1]

Soibelman did concede, however, that music in factories provided indirect benefits when proper programming, timing, and equipment were used. She also felt that it might have a role in reducing fatigue of workers doing repetitive tasks as well as aiding morale.[2]

Ross found several concrete examples of increased productivity in industry. In a test conducted with forty-five typists employed by the Equitable Life Assurance Society in New York, output increased seventeen per cent during six weeks after the introduction of music.[3] During the next six weeks, output held at sixteen per cent above the output prior to the introduction of music.

In the same article, Ross reports American Machine and Foundry Company's plant conducted a study in two principal assembly areas; one with music, one without. The department with music showed an increase in their efficiency ratio from 88.9 per cent to 91.4 per cent over a four-month period. The department without music dropped 1.2 per cent.[4] No

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[1]Newman, op. cit., p. 496.

[2]Soibelman, op. cit., p. 210.

[3]Susan Ross, "Background Music Systems--Do They Pay?" Administrative Management, XXVII (August, 1966), 34.

[4]Ibid., pp. 34-36.

explanation was given for the drop in rate.

Portable Electric Tool, Inc. of Geneva, Illinois, conducted an experiment with background music in which the workers experienced a five per cent increase in productivity.[1]

Mississippi Power and Light Company of Jackson, Mississippi, studied the productivity of key punch operators after the introduction of background music. They found that after nine months, productivity increased 18.6 per cent and that errors per 1000 cards decreased 37.0 per cent. Time required to process bills decreased 16.0 per cent.[2] No mention was made in the article of the number of workers involved in this study.

Prentice-Hall, Incorporated of Englewood Cliffs, New Jersey, introduced music to a sorting manual dexterity test given to fourteen operators. An increase of six per cent in productivity was noted.[3]

From these various experiments, Ross concludes, "Programmed work music alleviates fatigue, boredom or a worker's flagging interest in his work, without disrupting or disturbing him."[4] Other authors and researchers are not as positive as Ross as will be evidenced later in this section.

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[1] Ibid., p. 36.

[2] Ibid., pp. 36-37.

[3] Ibid., p. 37.

[4] Ibid.

Music has been tested not only for its concrete results, as in production, but also for its side effects in terms of morale and attitude. Edward Podolsky, M. D., feels music can also be a tranquilizer.

> In these days of tension, anxiety and high-pressure living, one of the best tranquilizers is music. This is a fact that has been known and accepted for a great many years, but in recent years this has been receiving a great deal of acceptance throughout the world.[1]

Podolsky cites several examples of this use of music. Melody Phone Company of Coral Gables, Florida, developed a phone that provides music for the party kept waiting on a line. A brokerage firm, Walston and Company, Incorporated, introduced music to customers watching market quotations. In a survey of New York's La Guardia and Kennedy airports, 81.5 per cent of the people questioned recommended music in the air. Music is also being used with favorable results, states Podolsky, in hospitals for the mentally retarded.[2]

Examination of these previously mentioned studies would seem to indicate there are some desirable effects of music in certain areas of human response. Part of the problem in achieving standard results depends not only on the types of jobs used in the studies, but also the type of medium used in reporting the studies.

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[1]Edward Podolsky, M. D., "Music as a Tranquilizer," Music Journal, XXIV (November, 1966), 41.

[2]Ibid.

Uhrbrook has categorized these reports into five areas: Popular articles, investigations, survey reports by government agencies and recreation agencies, commercial distributors of canned music and scientists.[1]

Uhrbrook draws this conclusion from the different studies, "Unqualified claims of increased production are not proven."[2] He acknowledges that factory workers do prefer working where music is played, but from one to ten per cent are annoyed by it; this can adversely affect the quality of work. He states three investigations reported that young, inexperienced employees doing simple, repetitive tasks, increased their output with music. However, experienced workers whose patterns were stabilized and performing complex tasks did not increase production with music.[3]

McGehee and Gardner contend most investigators would agree that increases in production which have occurred among workers does not come from the pacing or tempo of the music, but from the side effects of the music on workers' attitudes.[4]

Their findings come from a survey of 142 women workers in a rug manufacturing plant. The jobs in this experiment

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[1]Richard S. Uhrbrook, "Music on the Job: Its Influence on Worker Morale and Production," Personnel Psychology, XIV (Spring, 1961), 14-15.

[2]Ibid. [3]Ibid., pp. 35-36.

[4]William McGehee and James E. Gardner, "Music in a Complex Industrial Job," Personnel Psychology, II (Winter, 1949), 406.

were considered quite complex. Music was played four out of five days over a five-week period.[1]

The conclusion drawn from the experiment was that experimental music had neither a favorable or unfavorable effect upon the production of the workers as a group. To determine the attitudes of the workers about the music, a questionnaire was given to the women. Ninety per cent were returned and revealed these statistics: 84.5 per cent wanted the music continued; 1 per cent did not want it continued; 14.5 per cent did not care if it was continued or not.[2]

The conductors of the experiment did feel it was significant, though, that the employees believed music had made the work more pleasant, and that it had increased their actual production, although there was no statistically significant change in the amount of production.[3]

In a similar experiment with factory workers, Kirkpatrick concludes ". . . after a survey of experimental literature that no highly significant or conclusive research has been published concerning the effect of music on the output or health of workers in industry."[4] But similar to

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[1] Ibid., p. 408.

[2] Ibid., p. 411.

[3] Ibid., p. 414.

[4] Forrest H. Kirkpatrick, "Music in Industry," Journal of Applied Psychology, XXVII (June, 1943), 273.

the feelings of other experimenters, he felt that music could relieve boredom, facilitate socializing, increase happiness and contentment with work, and lessen fatigue.[1]

Benson sums up the research done with music in industry this way. There is not enough evidence for conclusive answers. Inconclusive and misleading statements have been drawn from surveys conducted without the benefit of a trained scientist.[2]

## II. EXPERIMENTS IN TYPEWRITING

The number of experiments done with music in typewriting is quite limited compared to those done in industry. It is also not as thorough or complete, as most of the experiments were done with a small group of subjects and for a limited period of time. It is also apparent that the number of variables in the classroom is harder to control than the variables in industry. The studies found by the author will be described in chronological order.

The earliest experiment the author found using background music in a typewriting class was done in 1930 by Jensen.[3] Jensen's thirty-seven week study was conducted at

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[1] Ibid.

[2] Barbara Elna Benson, Music and Sound Systems in Industry (New York: McGraw-Hill Book Co., 1945), p. 63.

[3] Milton B. Jensen, "The Influence of Jazz and Dirge Music Upon Speed and Accuracy of Typing," Journal of Educational Psychology, XXII (Fall, 1931), 458-462.

the Training School of the Central State Teachers College (Central Michigan University) in Michigan. His subjects were tenth, eleventh, and twelfth grade students and consisted of twelve boys and thirty-eight girls from fifteen to twenty-two years of age. Three kinds of music were played in the classroom: Normal, jazz, and dirge.[1]

Jensen reported jazz had no appreciable influence upon the typewriting speed, but it increased errors. The dirge brought about an average decrease from the normal of approximately five strokes per minute but reduced the number of errors.[2]

"Music is a serious distraction under conditions employed in this study," concluded Jensen. He also felt, however, that other types of music might have effects intermediate to the influence of jazz and dirge.

The next study located by the author was a thesis completed in 1963 at the State College of Iowa (University of Northern Iowa), Cedar Falls.[3] Shew experimented with two classes of second semester typewriting students. Both groups were given a straight copy timed writing test and a production test at the beginning of the experiment. Students

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[1] Ibid., p. 458.

[2] Ibid., p. 460.

[3] Carolyn Burd Shew, "The Effect of Background Music on Performance in Second Semester Typewriting in the Paseo High School, Kansas City, Missouri," (Unpublished Master's thesis, State College of Iowa, 1963).

were also given a musicality test and intelligence quotient scores and chronological ages were compared. Music was played in the background of the experimental class only. At the end of the experiment, both groups were given the same tests again.

Shew's findings showed that the experimental group evidenced greater improvement in both speed and accuracy in the straight copy tests than did the control group. The experimental group had a mean increase of 4.1 gross words a minute over the control group and a mean decrease of 5.98 in errors. The experimental group also showed slightly greater improvement on the production test with a .5 greater mean increase in words a minute. The groups were sufficiently alike with respect to musicality, intelligence quotient scores and age. Shew also felt that a strong likelihood existed that the advantage of background music in a typewriting class affected skill learning more than knowledge learning.[1]

In contrast to Shew's findings, a similar study was done with second semester typewriting students by Martinetti in 1966 with quite different results.[2]

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[1] Ibid.

[2] Donald G. Martinetti, "An Experiment To Determine If the Use of Background Music Aids in the Development of Speed and Accuracy in a Second Semester Typewriting Class at the Ninth-Grade Level," National Business Education Quarterly, XXXVI (Fall, 1967), 46.

Martinetti also experimented with two typing classes, but no information was given as to the number of students involved in the study. His method was somewhat different from Shew's in that at the end of six weeks, the control group and the experimental group were reversed. The experimental groups had background music playing only while working on speed and accuracy, not continuously during the period. Both groups were given three minute timings at the beginning of the experiment, at the end of the sixth week, and at the end of the twelfth week.[1]

The findings indicated that when comparisons were made between the groups, the critical ratio of difference between means did not exceed the .01 level of confidence and a null hypothesis was accepted.[2]

No mention was made in the article of how or if the students were matched or compared according to any criteria other than typewriting speed.

The last two studies deal with beginning rather than second semester typewriting students. In 1967, Bastady used five beginning typewriting classes consisting of 178 students.[3]

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[1] Ibid.

[2] Ibid., p. 47.

[3] Donald E. Bastady, "The Effect of Background Music on Beginning Typewriting Students at Porterville Union High School, Porterville, California," National Business Education Quarterly, XXXVII (October, 1968), 7.

Students were matched according to teacher, sex, class in school, manual or electric typewriter, intelligence quotient, and scores on a typing pretest. Of the total 178 students, 27 were matched to 27 in Group "A"; 16 were matched to another 16 in Group "B". At the completion of the experiment, 26 pairs remained in Group "A", and 13 pairs in Group "B".[1]

Music was introduced into the experimental classes and used throughout the experimental period, and no music was used in the control group. The music was purchased from a background music service and programmed by that service.[2]

Bastady's findings showed that the "A" group with music increased 1.74 words over the group without music, but there was no significant difference between the two groups in speed. Speed in the "B" group without music increased 1.16 words more than in the group with music, but this also was not a significant difference in speed. There was no significant difference between the control and experimental groups in terms of accuracy.[3]

The final study described conducted by Meeks again dealt with beginning students.[4] Forty-seven students were involved; twenty-six in the experimental group and twenty-one

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[1] Ibid. [2] Ibid. [3] Ibid.

[4] Wilda K. Meeks, "Soft Music Gains Favorable Results in Beginning Typewriting," Journal of Business Education, XLIV (October, 1968), 17.

in the control group. The study encompassed two semesters.

At the start of the term, each student was given a short questionnaire concerning the types of music they enjoyed, whether they played a musical instrument, etc. This was done to give the instructor an idea of how the students felt about music and to counteract their curiosity when music was played in the classroom. Music was introduced to the experimental class the second week of school.[1]

Meeks considered techniques, basic skill competencies such as timings, production work, and work attitudes and habits in her comparisons.

Results were tabulated and a "t-test" was used to measure significant differences in intelligence quotients and scholastic averages at the beginning of the year. Significant difference was computed for technique, production, and timings given during the year.[2]

The analyzed results showed no significant difference in the intelligence quotient scores or scholastic averages. In technique, production, and timings, Meeks reports a .01 statistical significance in favor of the experimental group. Her conclusion was that soothing background music did "stimulate or present a mood whereby students do better work in beginning typewriting."[3]

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[1] Ibid., p. 18.

[2] Ibid.

[3] Ibid.

The wide range of results in the preceding studies would seem to indicate that a great many variables are involved in trying to evaluate the effects of background music in typewriting classes, and that more experimentation is required in this field.

The most recent study located by the author is one by Melrose who conducted a study with forty-four high school students, half in an experimental class with music and half in a control class without music.[1] At the beginning of the experiment, comparisons were made of straight copy rates, intelligence quotient scores, chronological age and sex. No statistically significant differences were found between the two groups.

The background music for the experimental group was taped from the Muzak system and played on a tape recorder located on an elevated stand in the middle of the room. Music was played continuously in the experimental class, but the volume was turned down while directions were given.

The "t" test of significance was used in comparing the mean rates, per cent of accuracy on both straight copy and production work. No significant difference between the two groups was found.[2]

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[1]John E. Melrose, "A Study To Determine The Effectiveness of Background Music on the Performance of Beginning Typewriting Students at Menomonie High School, Menomonie, Wisconsin," (Unpublished Master's Thesis, University of Wisconsin, 1970).

[2]Ibid.

The varied findings of the research with music in typewriting definitely points to the need for further systematic research in the field.

# CHAPTER III

## PRESENTATION AND DEVELOPMENT OF DATA

### I. PROCEDURES

The eighty-four subjects in this study were enrolled in one-semester, elective, beginning typewriting classes at Valley High School, West Des Moines, Iowa, during the 1970-71 school year.

In this study, one class in the fall semester and one in the spring semester were randomly designated as control classes with no background music and two classes, one each semester, as experimental classes with background music. The school schedule consisted of a six-period day, during which the control group met the first hour both semesters and the experimental group the fourth hour both semesters. Both classes were taught by the author in the same manner, using the same methods and techniques with the exception of music in the experimental classes. The experimental classes were not told they were part of an experiment to negate the Hawthorne effect.

Music was not introduced to the experimental classes until after the presentation of the keyboard, approximately two weeks, and then a pre-test was administered to both groups. The pre-test consisted of a two-minute straight

copy timing from the Gregg General Typing 1 Book. (See Appendix A.) The students in the control groups were then paired with students in the experimental groups as closely as possible according to their rate and degree of accuracy on the pre-test. Although these were beginning classes, some students had had previous typewriting instruction; these students were then paired together. This process necessarily eliminated some students in each class. The students were also matched by sex, but the researcher did allow five mixed pairs out of the total forty-two pairs. Table I on the following page presents the rate and number of errors for the two groups at the start of the experiment.

Background music was supplied by 3M Background Music System and was played continuously in the experimental classes. The music consisted of modified rock and "work" music designed for offices, factories, and supermarkets, scientifically programmed to combat boredom and to relieve tension.[1] Speakers were installed in the ceiling of the room which produced an even distribution of sound throughout the room. Volume was controlled by the instructor, maintained at a relatively low level as suggested by 3M Company.

During the fall semester nearing Christmas vacation, a special tape was provided by 3M which played Christmas

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[1] Background Music Systems, 3M Company, "A New Concept in Background Music from 3M."

TABLE I

RATE AND NUMBER OF ERRORS OF CONTROL AND EXPERIMENTAL GROUPS ON TWO-MINUTE TIMING PRE-TEST

| Control | | | Experimental | | |
|---|---|---|---|---|---|
| Students' Initials | Rate | Errors | Students' Initials | Rate | Errors |
| V. H. | 42 | 5 | P. B. | 46 | 5 |
| R. O. | 42 | 2 | D. B. | 40 | 8 |
| L. H. | 31 | 6 | A. B. | 31 | 1 |
| J. R. | 30 | 1 | S. S. | 30 | 1 |
| J. B. | 29 | 4 | J. W. | 28 | 5 |
| B. M. | 28 | 2 | R. R. | 28 | 4 |
| K. C. | 27 | 6 | C. J. | 25 | 5 |
| B. S. | 23 | 4 | M. S. | 23 | 3 |
| D. P. | 21 | 6 | B. E. | 20 | 8 |
| D. H. | 21 | 1 | D. J. | 20 | 2 |
| G. H. | 20 | 4 | S. G. | 20 | 6 |
| K. S. | 20 | 2 | L. C. | 21 | 1 |
| J. G. | 18 | 3 | C. S. | 17 | 3 |
| J. C. | 17 | 5 | E. A. | 18 | 3 |
| D. S. | 17 | 7 | M. P. | 17 | 7 |
| B. M. | 17 | 2 | M. E. | 18 | 4 |
| G. R. | 17 | 2 | B. C. | 17 | 5 |
| D. W. | 17 | 2 | B. V. | 17 | 5 |
| B. M. | 17 | 5 | P. M. | 17 | 8 |
| L. W. | 16 | 2 | N. M. | 16 | 6 |
| B. W. | 16 | 6 | J. C. | 15 | 0 |
| E. S. | 15 | 6 | M. H. | 15 | 2 |
| P. B. | 15 | 2 | L. S. | 15 | 2 |
| V. C. | 15 | 1 | D. M. | 15 | 3 |
| L. P. | 15 | 2 | L. S. | 15 | 2 |
| G. W. | 15 | 3 | J. S. | 15 | 6 |
| S. G. | 15 | 2 | J. C. | 15 | 5 |
| V. C. | 15 | 1 | D. M. | 15 | 3 |
| D. G. | 15 | 3 | L. C. | 15 | 3 |
| D. W. | 14 | 3 | J. S. | 14 | 2 |
| B. O. | 14 | 2 | A. L. | 13 | 3 |
| B. M. | 14 | 1 | J. M. | 14 | 1 |
| M. N. | 13 | 4 | D. K. | 13 | 4 |
| J. C. | 13 | 3 | M. G. | 13 | 8 |
| J. D. | 13 | 3 | T. R. | 13 | 6 |
| F. B. | 13 | 1 | C. R. | 13 | 2 |
| D. K. | 12 | 10 | J. B. | 12 | 3 |
| T. S. | 12 | 7 | J. E. | 12 | 9 |
| C. M. | 12 | 3 | J. F. | 13 | 4 |
| P. D. | 12 | 2 | R. N. | 13 | 2 |
| E. A. | 11 | 7 | S. C. | 10 | 5 |
| S. R. | 10 | 3 | S. S. | 11 | 4 |

music every fourth selection. Other than that one example, the same tapes were played in the experimental classes both semesters.

The same three-minute timings were selected from the text, Gregg Typing 1, and administered at the end of eighteen weeks to both the experimental and control groups. (See Appendix B.) In each instance, the students were given three timings and the best combination score of speed and accuracy was recorded as a basis for comparison.

Gross words a minute rate and number of errors on the timings of the two groups were compared and the statistical significance was computed. The intelligence quotient scores for the subjects were obtained from the guidance department of the school. These scores were also compared and the statistical significance was computed. The intelligence quotient scores and sex of the subjects is shown in Table II.

## II. ANALYSIS OF THE DATA

In analyzing the data, the researcher used the "z" score test of significant difference, which involves comparing the means of two sample groups.[1] The formula used for the "z" test was: $$z = \frac{x_1 - x_2}{sD_{\bar{x}}}$$

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[1] N. M. Downie and R. W. Heath, Basic Statistical Methods, 3rd Edition, (New York: Harper & Row Publishers, 1970), p. 168.

TABLE II

INTELLIGENCE QUOTIENT SCORES AND SEX OF CONTROL AND EXPERIMENTAL GROUPS

| Control | | | Experimental | | |
|---|---|---|---|---|---|
| Students' Initials | I.Q. | Sex | Students' Initials | I.Q. | Sex |
| V. H. | 116 | F | D. B. | 121 | F |
| L. H. | 121 | F | A. B. | 125 | F |
| K. C. | 91 | F | C. J. | 120 | F |
| D. P. | 147 | F | B. E. | 114 | F |
| G. H. | 114 | F | S. G. | 131 | F |
| *B. M. | 136 | F | M. E. | 128 | M |
| G. R. | 120 | M | B. C. | 130 | M |
| D. W. | 105 | M | B. V. | 111 | M |
| B. B. | 132 | F | P. M. | 114 | F |
| L. W. | 123 | F | N. M. | 111 | F |
| B. N. | 127 | M | J. C. | 122 | M |
| P. B. | 120 | F | P. C. | 136 | F |
| E. S. | 111 | M | M. H. | 111 | M |
| L. P. | 129 | M | L. S. | 137 | M |
| V. C. | 120 | F | D. M. | 111 | F |
| D. W. | 120 | M | J. S. | 102 | M |
| B. M. | 141 | M | J. M. | 106 | M |
| J. F. | 113 | F | S. O. | 115 | F |
| J. C. | 106 | M | M. G. | 106 | M |
| T. D. | 117 | M | T. R. | 127 | M |
| M. N. | 132 | M | D. K. | 118 | M |
| P. S. | 118 | M | R. N. | 111 | M |
| C. H. | 106 | M | J. F. | 113 | M |
| *T. G. | 121 | M | J. E. | 100 | F |
| R. O. | 109 | M | D. B. | 103 | M |
| J. R. | 109 | F | S. S. | 109 | F |
| *J. B. | 102 | M | J. W. | 109 | F |
| *B. M. | 124 | M | R. R. | 105 | F |
| B. S. | 115 | F | M. S. | 122 | F |
| K. S. | 109 | F | L. C. | 110 | F |
| D. H. | 118 | M | D. J. | 121 | M |
| J. C. | 111 | F | E. A. | 116 | F |
| J. G. | 97 | M | C. S. | 107 | M |
| D. S. | 73 | F | M. P. | 115 | F |
| G. N. | 108 | M | J. S. | 125 | M |
| *S. G. | 105 | F | J. C. | 86 | M |
| D. G. | 123 | F | L. C. | 115 | F |
| B. O. | 115 | M | A. L. | 119 | M |
| F. B. | 104 | M | C. R. | 116 | M |
| D. K. | 89 | F | J. B. | 102 | F |
| S. R. | 103 | M | S. S. | 113 | M |
| E. A. | 115 | F | S. C. | 116 | F |

*Mixed Pairs

The mean rates of the control and experimental groups at the beginning of the experiment were 18.26 gross words a minute for the control group and 18.29 gross words a minute for the experimental, resulting in a difference of .03. Using the "z" score test, this difference was computed to be not significant at the .05 level.

The mean intelligence quotient score for the control group was 114.64 and 114.98 for the experimental. Again this difference of .34 was not statistically significant.

The total number of errors in the pre-test timing of each group was calculated showing the control group with a mean of 3.45 errors and the experimental group with a mean of 4.17 at the beginning of the experiment. This difference was not significant as measured by the "z" score test. Hence, there was no statistical difference between the control and experimental groups in terms of rate, errors, or intelligence quotient scores at the beginning of the experiment.

At the end of eighteen weeks, again the mean scores of the two groups concerning rate and number of errors were compared. The rates and number of errors for each student at the end of the experiment is shown in Table III.

The mean rate of the control group was 34.83 gross words a minute and the mean of the experimental group was 38.52 gross words a minute. This difference of 3.69 resulted in a "z" score of 1.963, which is significant at

TABLE III

RATE AND NUMBER OF ERRORS OF CONTROL AND EXPERIMENTAL GROUPS ON THREE-MINUTE TIMING POST-TEST

| Control | | | Experimental | | |
|---|---|---|---|---|---|
| Students' Initials | Rate | Errors | Students' Initials | Rate | Errors |
| R. C. | 53 | 2 | D. B. | 49 | 3 |
| G. H. | 48 | 2 | S. G. | 54 | 1 |
| D. P. | 47 | 3 | B. E. | 39 | 3 |
| L. W. | 45 | 2 | N. M. | 39 | 1 |
| L. H. | 44 | 3 | A. B. | 44 | 0 |
| B. S. | 44 | 3 | M. S. | 50 | 4 |
| B. M. | 43 | 0 | M. E. | 41 | 3 |
| D. H. | 42 | 3 | D. J. | 40 | 3 |
| G. R. | 41 | 2 | B. V. | 33 | 2 |
| J. R. | 40 | 5 | S. S. | 41 | 5 |
| S. G. | 40 | 5 | J. C. | 38 | 8 |
| B. B. | 40 | 3 | P. M. | 47 | 3 |
| K. C. | 40 | 2 | C. J. | 40 | 3 |
| J. B. | 38 | 3 | J. W. | 56 | 4 |
| P. C. | 38 | 1 | E. A. | 44 | 2 |
| V. H. | 37 | 3 | D. B. | 56 | 3 |
| B. M. | 37 | 2 | R. R. | 45 | 2 |
| P. B. | 36 | 5 | P. C. | 36 | 3 |
| G. N. | 36 | 3 | J. S. | 36 | 5 |
| D. G. | 36 | 3 | L. C. | 35 | 2 |
| L. P. | 36 | 1 | L. S. | 33 | 3 |
| D. S. | 35 | 9 | M. P. | 37 | 2 |
| J. F. | 35 | 2 | S. O. | 36 | 3 |
| V. C. | 33 | 3 | D. M. | 43 | 2 |
| B. M. | 33 | 3 | J. M. | 38 | 1 |
| B. N. | 32 | 3 | J. C. | 28 | 2 |
| E. S. | 32 | 2 | M. H. | 27 | 3 |
| K. S. | 31 | 4 | L. C. | 46 | 3 |
| M. N. | 31 | 3 | K. K. | 33 | 2 |
| P. S. | 31 | 0 | R. N. | 32 | 4 |
| J. G. | 30 | 4 | C. S. | 41 | 1 |
| J. C. | 30 | 4 | M. G. | 31 | 3 |
| D. W. | 30 | 3 | J. S. | 32 | 3 |
| B. O. | 28 | 4 | A. L. | 30 | 3 |
| F. B. | 28 | 3 | C. R. | 29 | 5 |
| T. D. | 28 | 2 | T. R. | 36 | 3 |
| S. R. | 27 | 2 | S. S. | 36 | 2 |
| C. H. | 26 | 3 | J. F. | 39 | 1 |
| E. A. | 22 | 2 | B. V. | 33 | 2 |
| D. W. | 22 | 2 | B. V. | 33 | 2 |
| D. K. | 20 | 2 | J. B. | 32 | 6 |
| T. G. | 18 | 5 | J. G. | 25 | 3 |

the .05 level.[1]

The mean number of errors of the control group at the end of the experiment was 2.88 and for the experimental group, 3.00. The difference was not significant at the .05 level.

An evaluation of the course was given to the students in the experimental groups at the end of eighteen weeks which included some questions about the music. Forty-three out of forty-six responded that if they had the opportunity to choose a typewriting class with background music or one without, they would choose the class with the music. This evaluation was given to all the students in the experimental sections, not just to those in the experiment.

Some comments concerning the music on the evaluation included: "Put me in better mood sometimes"; "It can make everything seem cheerful and less restricting"; "Made it more interesting"; "It relaxed me and made it easier to type"; "It relaxed you and you were ready for the work ahead"; "I like listening too (sic) music when I work, so I looked forward to this class"; "Interesting, never heard of music in any class before"; "It made it more cheerful"; "Created a better attitude because it made me feel more cheerful and relaxed--eager to work"; "It kept me from getting bored."

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[1] Ibid.

These remarks would tend to support the research mentioned earlier in this paper that in many cases the music does help morale and tends to reduce boredom.

# CHAPTER IV

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## I. SUMMARY

The purpose of the study was to determine the effects, if any, of background music on beginning typewriting students in terms of speed and accuracy. Background music supplied by the 3M Background Music System Company was played continuously in the experimental classes after the keyboard had been learned and a two-minute timing on straight copy material had been administered to both groups. No statistical difference existed between the control and experimental groups in terms of rate, errors, or intelligence quotient scores at the beginning of the experiment.

At the end of eighteen weeks, the experimental group averaged 3.69 gross words a minute faster on a three-minute timing than did the control group. The difference was significant at the .05 level. Comparison of errors of the two groups was calculated to be not statistically significant.

Students in the experimental classes seemed to enjoy the music based on comments made on a class evaluation form. Also, forty-three out of forty-six students indicated they would choose a typewriting class with background music over one without if given a choice.

## II. CONCLUSIONS

As the control and experimental groups were evenly matched at the beginning of the experiment, this study showed that background music did have a favorable effect on the gross words a minute rate on straight copy timings. The music did not affect the number of errors the students made.

The majority of students enjoyed the music and many felt it made the class seem more relaxed and more cheerful. An innovation such as this would seem to be a worthwhile technique to use in the classroom if it does contribute to a better learning environment.

## III. RECOMMENDATIONS

The author recommends that research in this area be continued in typewriting classes, as well as other classes, in an effort to develop new methods of teaching more effectively and to make learning more enjoyable for the student. The author would suggest, however, that some degree of uniformity be implemented in the experimentation to make the results more valid. Many different techniques have been used in the experimentations done thus far, and different behaviors have been measured resulting in a variety of conclusions.

To insure that background music does have a beneficial effect in many situations, more experiments using

similar procedures, testing similar aspects of students' behaviors need to be undertaken. Once this reliability is established, then other aspects, such as playing music during certain periods of time in the class, or playing different types of music could be tested.

# BIBLIOGRAPHY

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## A. BOOKS

Benson, Barbara Elna. Music and Sound Systems in Industry. New York: McGraw-Hill Book Co., 1945.

Clark, Kenneth S. Music in Industry. New York: National Bureau for the Advancement of Music, 1929.

Clem, Jane E. Techniques of Teaching Typewriting. New York: Gregg Publishing Co., 1955.

Downie, N. M., and R. W. Heath. Basic Statistical Methods. New York: Harper & Row, Publishers, 1970.

Hardaway, Mathilde, and Thomas B. Maier. Tests and Measurements in Business Education. Cincinnati: Southwestern Publishing Co., 1952.

Rowe, John L., Alan C. Lloyd, and Fred E. Winger. Gregg General Typing 1. New York: McGraw-Hill Book Co., 1967.

Russon, Allien R., and S. J. Wanous. Philosophy and Psychology of Teaching Typewriting. Cincinnati: Southwestern Publishing Co., 1960.

Soibelman, Doris. Therapeutic and Industrial Uses of Music, A Review of the Literature. New York: Columbia University Press, 1948.

## B. PERIODICALS

Bastady, Donald E. "The Effect of Background Music on Beginning Typewriting Students at Porterville Union High School, Porterville, California," National Business Education Quarterly, XXXVII (October, 1968), 7-8.

Dyer, Richard W. "Harmonizing Timed Writing Grading Scales With Principles of Motor-Skill Development," Business Education Forum, XIX (November, 1964), 13-14.

Jensen, Milton B. "The Influence of Jazz and Dirge Music Upon Speed and Accuracy of Typing," Journal of Educational Psychology, XXII (Fall, 1931), 458-462.

Kirkpatrick, Forrest H. "Music in Industry," Journal of Applied Psychology, XXVII (June, 1943), 268-274.

Lloyd, Alan C. "Typewriting Futures," Business Education World, XLVIII (February, 1968), 9-10.

Martinetti, Donald G. "An Experiment To Determine If the Use of Background Music Aids in the Development of Speed and Accuracy in a Second Semester Typewriting Class at the Ninth-Grade Level," National Business Education Quarterly, XXVI (Fall, 1967), 46-47.

McGehee, William, and James E. Gardner. "Music in a Complex Indistrial Job," Personnel Psychology, II (Winter, 1949), 405-417.

Meeks, Wilda K. "Soft Music Gains Favorable Results in Beginning Typewriting," Journal of Business Education, XLIV (October, 1968), 17-18.

Newman, Richard I., Donald L. Hunt, and Fen Rhodes. "Effects of Music on Employee Attitude and Productivity in a Skateboard Factory," Journal of Applied Psychology, L (December, 1966), 493-496.

Peterson, John C. "The First One Hundred Years," Business Education Forum, XXII (November, 1967), 3.

Podolsky, Edward. "Music as a Tranquilizer," Music Journal, XXIV (November, 1966), 41.

Ross, Susan. "Background Music Systems--Do They Pay?" Administrative Management, XXVII (August, 1966), 34-37.

Uhrbrock, Richard S. "Music on the Job: Its Influence on Worker Morale and Production," Personnel Psychology, XIV (Spring, 1961), 14-15.

## C. UNPUBLISHED WORKS

Melrose, John E. "A Study To Determine The Effectiveness of Background Music on the Performance of Beginning Typewriting Students at Menomonie High School, Menomonie, Wisconsin." Unpublished Master's Thesis, University of Wisconsin, 1970.

Shew, Carolyn Burd. "The Effect of Background Music on Performance in Second Semester Typewriting in the Paseo High School, Kansas City, Missouri." Unpublished Master's Thesis, State College of Iowa (University of Northern Iowa), 1963.

## D. OTHER SOURCES

Background Music Systems, 3M Company. "A New Concept in Background Music from 3M."

# APPENDIX

# APPENDIX A

## TWO-MINUTE TIMING PRE-TEST

Dear Bill: The new coach takes over on the sixth of June. He likes the players on his squad to be husky--I guess my size will keep me off the team. Dear Jeff: I think it would be fine to have Mike map out the trail for our hike, but he is so hard at work that I doubt he has time to do it for us.

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# APPENDIX B

## THREE-MINUTE TIMING POST-TEST

The postal number that we type so neatly on labels and envelopes emerged from the Zoning Improvement Plan that the Post Office started in the spring of 1963 as a way to speed delivery of the mail. The five figures in the number are a special code that lets mail be sorted much more quickly and accurately. The plan caught on at once, and business firms throughout the nation put the codes on their mailing lists.

There are two phases, one concerned with bulk mail and another that has to do with individual cards and envelopes. Although typists are involved only in the second kind, they should know that ZIP numbers do not apply to letters alone.

The bulk mail, like magazines and circulars, has to be placed in bags, one for each local postal zone to which the mailing is to go. The mailers like the plan for, once they adjust their mailing lists, it is easy to bag what they are mailing, and the bags start on their way without any delay.

Handling a single card or envelope is different. Such pieces must be sorted in the Post Office. If the cards and envelopes have the full postal zone number in precisely the right place, the sorting can be done ten times as fast by a scanning machine as it ever could be by human eye and hand.

What is the proper place? It is after the state name,

preceded by some blank space. How much space? The scanner requires not less than a sixth nor more than a half inch of space. The postal department stresses that the code be not less than two nor more than six spaces away from the state.

It is confusing to keep so many numbers in mind; it is better to standardize on one spacing habit that is safe and efficient and distinctive. This is why you are told to put three spaces between each state name and the postal number. Leave three spaces in the inside address, as well as on the envelope, so that "three spaces and a ZIP" becomes a habit.

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